Please replace the paragraph beginning at page 2, line 4, with th following rewritten paragraph:

In this arrangement, the circuit board 43 is transferred to a specified mounting position by the transfer section 42. In order to load to the head 45 a suction nozzle 49 corresponding to the component 44 to be mounted, the X-Y robot 47 moves the head 45 to a location above the nozzle station 50, separates the currently loaded suction nozzle 49 from the head 45, and then loads to the head 45 a suction nozzle 49 matching the component 44 to be next mounted. Next, the X-Y robot 47 moves the board recognition camera 46 to a location above the circuit board 43 and measures a board mark 51 provided on the circuit board 43, thus accomplishing an operation of recognizing the mounting position. Subsequently, the X-Y robot 47 moves the head 45 to the feed section 41, sucks up the fed component 44 by the suction nozzle 49, and moves the head 45 to a location above the mounting position on the circuit board 43. In this operation, the suction posture in which the component 44 is sucked up by the suction nozzle 49 is recognized by a component recognition camera 52. Based on this component posture information, an operation of correcting the suction posture is performed, and the component 44 is mounted at the specified position on the circuit board 43.

Please replace the paragraph beginning at page 3, line 1, with the following rewritten paragraph:

In production processes with the component mounting apparatus as described above, it can occur that the operation of the apparatus is stopped due to the state of the apparatus, mis-feedings of components, and the like. When the apparatus is restarted after such a temporary stop, there are some cases where an unmounted component remains stuck to the suction nozzle due to residual pressure of the vacuum of the suction nozzle. In this state as it is, if a switching operation of the suction nozzle is executed, the

component would enter the pocket of the nozzle station, causing the apparatus to be damaged.

Please replace the paragraph beginning at page 3, line 13, with the following rewritten paragraph:

The suction nozzle for sucking up abnormal-shaped components or small-sized components such as connectors and transformers with less area of flat surfaces is more likely to suffer suction errors due to clogging with dust or the like, so that the maintenance of the suction nozzle needs to be exercised on demand. The operator would take out the suction nozzle from the apparatus and, after cleaning it, accommodate it to the apparatus. In this process, there may occur human errors such as mis-positioning in returning the suction nozzle. Because the suction nozzle is controlled by a controller that controls the operation of the component mounting apparatus, a mis-positioning in returning the nozzle by the operator would, in some cases, cause the component mounting apparatus to be damaged due to inconsistency with the controlling operation of the apparatus.

Please replace the paragraph beginning at page 4, line 4, with the following rewritten paragraph:

Besides the above disadvantages, the number of kinds of suction nozzles has been increasing with diversified components to be mounted so that frequent changeovers of suction nozzles are needed in the production of one circuit board. As a result, there has arisen a demand for a stable operation that ensures a reliable execution of the control of suction nozzles.

Please replace the paragraph beginning at page 9, line 25, with th following rewritten paragraph:

According to the first and second aspects, during a time period in which the suction nozzle is out of the component mounting operation, a component remaining at the suction nozzle by vacuum residual pressure is discarded by the remaining-component discarding device. Thus, any errors of the apparatus operation as well as faults due to remaining components can be prevented from occurring. Also, performing the discarding operation by the exhaust of compressed air allows dust and the like sticking to the suction nozzle to be removed.

Please replace the paragraph beginning at page 10, line 17, with the following rewritten paragraph:

According to the fourth aspect, during a time period in which the suction nozzle is out of the component mounting operation, a component remaining at the suction nozzle by vacuum residual pressure is discarded by the remaining-component discarding device. Thus, any errors of the apparatus operation as well as faults due to remaining components can be prevented from occurring. Also, performing the discarding operation by the exhaust of compressed air allows dust and the like sticking to the suction nozzle to be removed. Furthermore, by performing the identification of the presence or well as the kind of a loaded suction nozzle by identifying device, any errors of the apparatus operation as well as faults due to some errors of the like can be prevented from occurring.

Please r place the paragraph beginning at page 11, line 7, with the following rewritten paragraph:

A8 According to these aspects, the time carrying in and out circuit boards is a time which the mounting operation is stopped. By performing the aforementioned individual operations during this time period, the operations of clearing suction nozzle can be achieved.

Please replace the paragraph beginning at page 12, line 3, with the following rewritten paragraph:

A9 Fig. 5 is a perspective view showing the arrangement of a prior art component mounting apparatus .

Please replace the paragraph beginning at page 12, line 11, with the following rewritten paragraph:

A10 Hereinbelow, one embodiment of the present invention is described with reference to the accompanying drawings for an understanding of the present invention. The embodiment below is only an example of the present invention, and should not be construed as limiting the technical scope of the present invention.

Please replace the paragraph beginning at page 12, line 24, with the following rewritten paragraph:

A11 Referring to Fig. 2, the component mounting apparatus 1 comprises: a board transfer section 9 equipped with a loader 11 for loading a circuit board 2 coming up from a preceding step, to a component mounting position within the apparatus, and with an

unloader 12 for carrying out the circuit board 2 having components mounted thereon to a succeeding step; an X-Y robot (serving as an example of the component mounting section) 8 for picking up a component to be mounted from a reel type component feed section 13 and a tray type component feed section 14 and mounting it onto the circuit board 2; and a component recognition camera 7 for taking an image of the suction posture of the component sucked up by a suction nozzle equipped on the X-Y robot 8. Operations of these members are controlled by a controller 500. A main-part arrangement of this component mounting apparatus 1 and its operation are explained below with reference to Fig. 1.

Please replace the paragraph beginning at page 13, line 16, with the following rewritten paragraph:

Referring to Fig. 1, a head 3 of the X-Y robot 8 is equipped with nozzle holders 16, 17 for removably loading a suction nozzle 19 that sucks up and holds a component 5, and with a board recognition camera 10 for recognizing the component mounting position. A plurality of suction nozzles 19 suited to suck up a plurality of kinds of components to be mounted onto the circuit board 2 are accommodated at their respective specified positions of a nozzle station 6. Based on control programs of the apparatus, the X-Y robot 8 selects, from the nozzle station 6, suction nozzles 19 suited to suck up the components, and loads the suction nozzles 19 in the nozzle holder 16, 17. A component 5 is sucked up from the component feed section 14 and held by each of the suction nozzles 19. The suction posture of the component 5 is recognized by the component recognition camera 7, and any shift from a reference posture is corrected by rotation of each of the nozzle holders 16, 17. The head 3, to which the component has been sucked up by the suction nozzle 19, is moved to a location above the circuit board 2 held in a main holding section, the head is located above a specified mounting position, where a board mark 18, provided on the circuit board 2, is shot by the board recognition camera 10 so that the mounting position

is recognized. Then, based on this recognition data, the component 5 is mounted at the specified position.

Please replace the paragraph beginning at page 14, line 16, with the following rewritten paragraph:

In Fig. 1, a box-like article depicted below the head 3 is a component discarding box 4, which is equipped, on its one side, with a transmission sensor (serving as one example of the nozzle identifying device) 20 for deciding the presence or absence of the suction nozzle 19 based on that the optical axis is cut off by the loaded suction nozzle 19 when the nozzle holder 16 or 17 is lowered. Also, each suction nozzle 19 is provided with a nozzle identifying mark 22 such as a bar code that differs from nozzle to nozzle. The identifying mark is recognized by a nozzle identifying sensor (nozzle identifying device) 21.

Please replace the paragraph beginning at page 15, line 10, with the following rewritten paragraph:

Now the fault preventing operation in the component mounting apparatus 1, constructed as described above, is described below with reference to the time chart of Fig. 3 as well as the flow chart of Fig. 4.

Please replace the paragraph beginning at page 15, line 14, with the following rewritten paragraph:

Referring to Fig. 3, upon receiving a signal EOP (End of Program) representing an end of a mounting process for one circuit board 2, the component mounting apparatus 1 puts the board transfer section 9 into operation, so that the component-mounted circuit

board 2 is transferred from the main holding section to the unloader 12 (① in Fig. 3). With the circuit board 2 removed from the main holding section, a circuit board 2, which is to be used for the next mounting process, is carried into the main holding section from the loader 11 (②in Fig. 3). The circuit board 2 that has been transferred to the unloader 12 is carried out in response 25 to a request from the next step (③in Fig. 3). With no circuit board 2 present on the loader 11, when a circuit board 2 that is over the preceding step is carried into the loader 11, a preparation for the next mounting process is made (④in Fig. 3).

Please replace the paragraph beginning at page 16, line 5, with the following rewritten paragraph:

In the productional operation with the component mounting apparatus 1, as seen above, a wasteful time Ts is needed for the carriage-in and -out of the circuit board 2 before a circuit board 2 for the mounting process comes to be held at the main holding section. By making use of this 10 wasteful time Ts, identification and clearance of the suction nozzles 19 that have been loaded in the head 3 are executed, so that the operation of preventing such faults as mismatch and clogging of the suction .nozzle 19 is implemented, which characterizes the component mounting apparatus 1 according to the present embodiment. This operation is explained below with reference to the flow chart of Fig. 4. It is noted that reference characters S1, S2, ... shown in Fig. 4 are step numbers showing the operating procedure, which are coincident with numbers incorporated in the description herein.

Please replace the paragraph beginning at page 16, line 21, with the following rewritten paragraph:

Referring to Fig. 4, when the transfer operation of the circuit board 2 is started (S1), the X-Y robot 8 moves the head 3 to above the component discarding box 4 (S2). When

the head 3 having the suction nozzles 19 is lowered to a specified descent point, compressed air is fed from a compressor 501 to one of the suction nozzles 19, by which the component 5, if remaining at the suction nozzle 19 due to vacuum residual pressure, is removed while dust and the like sticking to the suction nozzle 19 are removed away simultaneously (S3).

Please replace the paragraph beginning at page 17, line 6, with the following rewritten paragraph:

During this operation, the transmission sensor 20 checks whether or not the suction nozzle 19 of the head 3 is present (S4). Also, the nozzle identifying sensor 21 identifies the suction nozzle 19 that has been loaded, by which the matching to the current head controlled by the memory of the controller 500 is checked (S5). As a result of this decision, if a mismatch of the suction nozzle 19 is confirmed, then the operation of the component mounting apparatus 1 is halted (S10), while a message representing the occurrence of a mismatch is outputted (S11). If a match between the loaded suction nozzle 19 and the memory is confirmed, then the exhaust of compressed air is halted, and the head 3 lifts up the suction nozzle 19.

Please replace the paragraph beginning at page 17, line 19, with the following rewritten paragraph:

Since the head 3 is equipped with a plurality (n) 20 of suction nozzles 19, the X-Y robot 8 moves the next suction nozzle 19 to a specified position on the component discard box 4, executing the same operations as the steps S3 to S5. This operation of nozzle clearance and decision is repeated until all the n suction nozzles 19 are completely treated (S6 and S7). The X-Y robot 8, after the completion of nozzle decision (S8), moves the head 3 to the nozzle station 6, disconnecting the currently loaded suction nozzle 19 and

loading a suction nozzle 19 matching the next-sucked component 5 to the head 3. Now if the transfer of the circuit board 2 to the main holding section by the board transfer section 9 has been completed (S9), the mounting operation of the component mounting apparatus 1 can be started.

Please replace the paragraph beginning at page 18, line 9, with the following rewritten paragraph:

The component mounting apparatus 1 according to this embodiment as described above has been so arranged as to be capable of executing all the functions of discarding the component remaining at the suction nozzle 19, detecting the presence or absence of a suction nozzle 19 loaded in the head 3, and determining whether there is a match between the suction nozzle 19loaded to the head 3 and the control memory. Instead, any of these functions may be adopted singly.

Please replace the paragraph beginning at page 18, line 17, with the following rewritten paragraph:

Also, the component mounting apparatus 1 according to this embodiment has been so arranged as to be able to execute the fault preventing operation during the transfer of the circuit board 2. However, the fault preventing operation may also be executed during a period for which the X-Y robot 8 keeps out of the mounting operation of the component 5, including the duration of transfer of the circuit board, for example during a period for which the apparatus operation is stopped halted due to the state of the apparatus, mis-feeding of components, or the like.

Please replace the paragraph beginning at page 19, line 3, with the f ll wing rewritten paragraph:

A22

Furthermore, the transmission sensor 20 for detecting the presence or absence of a suction nozzle 19 5 and the nozzle identifying sensor 21 for making the decision and recognition on the suction nozzle 19 may also be equipped on the head 3 so that a plurality of suction nozzles 19 are moved up and down so as to be checked one after another.

Please replace the paragraph beginning at page 19, line 10, with the following rewritten paragraph:

A23

As described above, according to the first and second aspects of the present invention, since the operation of discarding remaining components is executed during the period in which the component mounting operation is halted, a component, even if remaining at the suction nozzle due to vacuum remaining pressure, is removed by the exhaust of compressed air. As a result, any apparatus faults due to remaining components can be prevented from occurring. Also, since the exhaust of compressed air removes dust and the like which are stuck to the suction nozzle, such trouble as suction errors of the suction nozzle can be prevented from occurring, so that a stable apparatus operation can be realized.

Please replace the paragraph beginning at page 19, line 23, with the following rewritten paragraph:

A24

According to the third aspect of the present invention, during the period in which the component mounting operation is halted, the presence or absence of suction nozzle loaded in the head can be detected by moving the suction nozzle to a specified position

and moreover the identification of the kind of the suction nozzle loaded in the head can be achieved. Therefore, any errors of the loaded or accommodated position of the suction nozzle due of the operator can be detected so that operating loss or other losses due to apparatus faults can be prevented.

Please replace the paragraph beginning at page 20, line 9, with the following rewritten paragraph:

According to the fourth aspect of the present of invention, during the operations of discarding the dust and the like, the checking of the presence or absence of the loaded suction nozzle as well as its identification can be executed simultaneously. Therefore, there can be provided a component mounting apparatus which contributes to stable production free from any operating errors and human errors.